

## Libellulas Collected in Florida by Jesse H. Williamson, with Description of a new Species (Odonata).

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Mr. Jesse H. Williamson collected dragonflies in Florida from March 1 to April 26, 1921. Localities visited and dates are as follows: Sebring, March 1; Fort Myers, March 3-7 and 10-19; Taxambas, Marco Island, March 8; Labelle, March 21-27; Moore Haven, March 29-30 and April 2; Palmdale, March 31 and April 3-8; enroute Moore Haven to West Palm Beach, across Lake Okeechobee, April 9; Miami, April 12; Enterprise, April 15-26. From April 29 to May 9 he collected at Kathwood, Aiken County, South Carolina, but on these dates most of the species observed were just emerging. Among the 4547 specimens collected, representing 65 species, are several new and many interesting things, the most remarkable and surprising of which is the fine *Libellula* described below. This Florida collection has been studied and arranged by J. H. W. and duplicates are being distributed to students and institutions.

### *Libellula jesseana* new species.

Abdomen: ♂, 38-40; ♀, 35; hind wing, ♂, 41-43; ♀, 43; stigma, front wing, 6-6.8 mm.

♂.—Labium brown with a slight greenish cast; genae and mandibles similar, the latter more yellowish; labrum black; anteclypeus greenish brown; postclypeus, frons, antennae and frontal vesicle black, the latter nearly squarely truncate, the externoapical points shining; occiput black; rear of head brown with greenish or yellowish tinges and with a more or less distinct paler spot against the eye at midheight and another larger one below this.

Dorsum of prothorax and thorax black pruinose; mesepimeron and metepisternum similar but paler, more or less shaded, especially about the humeral and second lateral sutures, with greenish or yellowish brown; the metepimeron and thorax beneath this paler color.

Abdomen slender; above the lateral carina black; below the lateral carina brown to black with a greenish or yellowish cast and a more or less distinct yellowish area on either side posterior to the posterior transverse carina on each of segments 2-8; sterna brown to black; appendages brown to black.

Ventro-external face of the genital hamule roughly triangular in

shape, the posterior edge nearly at right angles to the abdomen, the antero-dorsal edge relatively long, longer than in *auripennis*, so that the face of the hamule is relatively broader in *jessicana*. In *incesta* the anterior angle is obliterated in a curve joining the antero-ventral and the antero-dorsal edges, and the face is relatively slender as in *auripennis*.

In a younger male the labium, genae and mandibles are pale dull yellow, the postclypeus shades out to dark greenish adjacent to the eyes, and there is a green spot on the frons, against the eye, just above this. The dorsum of the thorax is brown with a purplish cast; the sides of the thorax are largely pale yellow with the posterior two-thirds of the mesepimeron and the upper part of the metepisternum darker, thus defining two more or less distinct pale stripes, one just posterior to the humeral and the other just posterior to the second lateral suture. Dorsum of abdomen similarly paler, 3-6 slightly lighter in color and yellowish adjacent to the lateral carina: 7-9 with a longitudinal dorsal black stripe occupying about one-third the area on each side between the middorsal line and the lateral carina (probably in younger individuals this dorsal black stripe is defined on more basal segments); 10 and appendages yellowish brown; abdomen beneath, between the lateral and ventral carinae, pale greenish or yellowish on 2 and 3, shading darker to greenish or yellowish brown on the segments posterior to 3, a more or less distinctly darker subapical area on either side of each segment; sterna at base of 3 and on 9 and 10 yellowish, otherwise dark to black.

Coxae pale yellowish to pruinose brown; legs brown to nearly black; femora paler at base and with the dorso-posterior surface pale yellowish to brown, darker apically.

Wings basally, posterior to *A* and proximal to the distal angle of the triangles, hyaline; remainder of wing reddish yellow, sometimes slightly more intense in the area between nodus and stigma, the extreme apex very narrowly and inconspicuously dusky tipped; the basal spaces anterior to *A* are not as deeply tinged as the apical portion of the wing. Venation basal to about the level of the triangles dark to black; distal to this point all the veins are reddish yellow excepting the veins on the anterior and posterior sides of the stigma and the posterior wing margin, which are black; stigma dragon's blood red (Ridgway). For venational characters see following the description of the female wings.

♀.—Labium pale dull yellowish brown; genae and mandibles greenish; labrum yellow with a large median basal rounded black spot which is joined basally on either side with a more or less extensive lateral spot which reaches and extends more or less along the anterior margin but does not attain the lateral margin above; anteclypeus greenish brown; postclypeus and frons brown to nearly black, each on either side in front, against the eye, with a greenish or bluish spot; occiput brown; rear of head brown, similar to that of the male.

Thorax as in the younger males, the sides more uniformly yellowish,

the darker posterior areas on the mesepimeron and on the metepimeron and on the upper part of the metepisternum only slightly or not at all evident, so the pale stripe posterior to the humeral and to the second lateral suture are not as well marked as in the male or are wanting altogether, disappearing in the prevailing pale color of the sides.

Abdomen similar to younger males; the dorsal longitudinal black stripe described on 7-9 is faintly discernible as a darker stripe on 2-9 in the female; 8 perfoliate.

Wings hyaline, more or less yellowish tinged in the basal spaces anterior to *A*, and along the costal border, especially distal to the nodus and anterior to *R*; apex to level of stigma dusky, the inner edge diffuse; costa yellow except at base, clearest and brightest between nodus and proximal end of stigma, distal to which point it is black; nodus and subnodus more or less yellow; the other veins dark to black; stigma burnt sienna (Ridgway), apical fourth or third black; the dark color produced basally along the anterior and posterior borders, especially the former; enclosing veins black. Venational characters below. Legs as in the male.

*Venational characters of both sexes.*—Antenodals, front wing 17 to 19, usually 19; hind wing 13 to 15, usually 14; postnodals, front wing 11 to 14, usually 12 or 13; hind wing 12 to 16, usually 13 or 14; triangle front wing with 2 or 3 crossveins, usually 2; hind wing 1; crossveins in supertriangle front wing 0 to 2, usually 1; hind wing 0 or 1, usually 0; cells in subtriangle front wing 5 or 6, usually 5; cells in loop posterior to subtriangle, front wing, 2 or 3, usually 2; cubito-anal crossveins front and hind wings, 1; bridge crossveins front and hind wings 3 to 5, usually 4 or 5; triangle front wing followed by 4 or 5 cells, usually 4, then 3 or 4 followed by 4 increasing; 2 rows of cells between *M*<sub>4</sub> and *M*<sub>sp1</sub> in front and hind wings; crossveins against the distal transverse side of the anal loop on its proximal side 4 or 5; crossveins against the proximal side of the anal loop on its distal side 9 to 11, usually 9.

Enterprise, Florida, April 22 and 26, 1921, 44 males, 2 females, collected by Jesse H. Williamson, for whom this handsome species is named. *Type* male and *allotype* female, taken in copulation, April 26, 1921, in coll. E. B. W.

Both sexes of *jesseana* are separated at once from those of *auripennis* by the darker face and frons, and dorsum of thorax and abdomen. In wing coloration the male differs from *auripennis* in the more intense reddish yellow of the wings posterior to *R*, the color in *auripennis* being more intense along the costal border. In the females of the two species there is little or no difference in the wings except that the costa basally is darker in both sexes of *jesseana* than in the

sexes of *auripennis*. From the related species with dark colored bodies *jesscana* is separated at once by the reddish yellow unspotted wings of the male and the red stigma of the male and the burnt sienna stigma of the female. From *flavida*, *jesscana* is separated, among other characters, by the absence of dark colored basal wing markings.

About Enterprise are many small lakes, locally called ponds. Collections were made at eight of these, four north of the town and four east. All ponds are of the same general character, though some are more marshy than others. They lie about twenty feet below the general land surface among turpentine pine hammocks. The soil is sand and there are no inlets or outlets to the ponds. The water is clear and cold and fit to drink. Seven of the ponds were without any *Libellula* inhabitants. At the eighth pond *Libellula jesseana*, and no other *Libellula*, was taken. In J. H. W.'s notes this eighth pond, in the absence of any local name, is designated as Figure-8 Pond. It lies two and one-half miles (estimated) north of the town, going out the hard shell road past the cemetery. It is about a quarter of a mile east of the road and about half a mile due north of Buckeye Homestead Pond. The latter pond can be seen from the road. Gleason's Pond lies about three quarters of a mile east of Buckeye Homestead Pond. North of Gleason's Pond lies Wiley Pond.

Figure-8 Pond is about one-quarter of a mile long and one-eighth wide, shaped roughly like the figure 8. It has a solid sand bottom, deepening more rapidly than other ponds visited, being waist deep four or five feet from shore. Grassy sedges, shoulder high, grow from the water's edge out into the water for a distance of five or six feet. Then, within this zone, is a clear water zone eight to twelve feet wide, within which is another belt of vegetation several feet wide and rising above the water one or two feet. There are no bushes in the water and no marsh. The banks from the water's edge are steep sand with sparse dead grass and scattered young pines two to ten feet high. All around the pond the higher ground had been recently burned over but fire had reached the pond only at a few points, leaving some green pines near the water's edge.

*Jesseana* was usually over the shore-bordering zone of sedges, alighting on stems and leaves, and, when back from the water, on the bare twigs of the burned pines. It is very wary and difficult to approach, and is a good dodger either when at rest or on the wing. In general habits it mostly resembles *L. auripennis*. Other species associated with *jesseana* were *Tramea carolina*, *Coryphaeschna ingens*, *Anax longipes*, a *Progomphus*, and *Enallagma doubledayi*.

The question whether *jesseana* might not be a hybrid of *auripennis* and some other species naturally suggested itself. Libellulas generally are of wide distribution and their habits as imagoes render them conspicuous. No new species has been added to the eastern North American fauna in over fifty years, and the discovery of an undescribed species in Florida was a great surprise. At first I was inclined to regard it as a hybrid, but on farther study I have abandoned this opinion. Its general appearance, due to wing coloration, at once suggests *auripennis*. Dr. Calvert and Dr. Ris, writing independently, see something of *flavida* in it, but neither attributes this to hybridization and Dr. Ris especially is convinced it is not a hybrid. Dr. Kennedy also considers it specifically distinct and not a hybrid. In its restricted distribution and its suggestive synthesis of characters *jesseana* resembles another dragonfly in another subfamily which I know well. *Macromia wabashensis* is known only along two or three miles of the Wabash River near Bluffton, Indiana, where it has been found continuously from 1902 to 1921. In characters it is just what one might expect from the crossing of *M. tacniolata* and *M. pacifica*, both of which species, as well as *M. illinoensis*, occur on the same stretch of river. If *wabashensis* is a hybrid it has certainly held its own for at least twenty years. It is possible that failure to record it elsewhere may be due to lack of collecting. This last factor can hardly be used to explain the limited known distribution of *L. jesseana*. It remains to be seen if *jesseana* maintains itself and is able to extend its range from the single small lake where it is now known to occur.

Other species of *Libellula* collected by J. H. W. are listed below. Species of *Ladona* are not included in this paper. A few specimens collected in 1904, 1906 and 1908, by Mrs. Stella Deam, and in 1911 and 1913 by L. A. Williamson are also recorded. All notes on habits and captures are from J. H. W.'s field notes.

*Libellula auripennis* Burmeister, West Palm Beach, February 24, 1904, teneral female (Deam); Salt Lake, near St. Petersburg, April 21, 1908, female (Deam); March 26, 1913, three teneral males (L. A. W.); Sarasota, April 4, 1911, two males, two females (L. A. W.); Taxambas, Ft. Myers, Labelle, Moore Haven, Palmdale, Miami and Enterprise, forty males and thirty-nine females, tenerals and adults at each location. Kathwood, South Carolina, a single teneral male.

*Auripennis* is found scattered over fields and pastures, often far from water. Adult males with red abdomens flew swiftly over or near open streams in fields. Adults difficult to catch. Some, but not all, of the males from Enterprise have the wings more extensively reddish yellow than any other specimens in the collection. In this character they approach but do not reach the intensity of *L. jesseana*. Otherwise they are typical *auripennis*.

*Libellula incesta* Hagen. Labelle, fifteen males, one female; Palmdale, thirty-six males, fifteen females; Enterprise, one male, one female. Found on wooded part of Pollywog Creek at Labelle and of Fisheating Creek at Palmdale, and seen nowhere else about these two towns.

Of the seventeen females in the collection all but two have a distinct dark postnodal streak between *C* and *R*. It is also present in about one-half of the males. In both sexes it varies from entirely absent, through faintly present to clearly present and, finally, in the most extreme cases, it becomes a continuous brown streak from nodus to stigma. The streak is darkest in tenerals of both sexes, but all tenerals do not have it; the darkest specimens seen are teneral females. This wing marking is not therefore entirely sexual or ontogenetic, though it tends to be both, being darker in females and in tenerals.

*Libellula axilena* Westwood. Daytona Beach, March 26, 1906, one female (Deam); St. Petersburg, March 13 and 22, 1913, one male and three females, all very teneral (L. A. W.); Fort Myers, Labelle, Palmdale and Enterprise, fourteen males and nine females.

All the specimens of *axilena* are young with the teneral body color pattern distinct, and the postnodal wing streak between *C* and *R* and nodal spots are present in every specimen. In every specimen but one the brown area about the metastigma is continuous with the brown area anterior to it. In every case the brown stripe on the second lateral suture is wider than in *vibrans*, and between this stripe and the dorsal thoracic dark area, on the side of the thorax above, is a triangular brown area which is entirely wanting in *vibrans*. In *vibrans* the postnodal wing streak is present in one female, faintly present in two males and two females, and absent in nineteen males and fourteen females. In every case the brown area surrounding the metastigma is separated from the dark area anterior to it, and the sides of the thorax above, between the humeral and second lateral sutures, are entirely pale.

The color pattern of the thorax as well as the pale face and frons thus separate *vibrans* certainly from *axilena*.

At Fort Myers, flying about and alighting on dried vegetation in the sun along a fence separating a cemetery and orange grove. This species and *vibrans* were not recognized as distinct when captured and it is impossible now to state definitely any difference in habitats. In L. A. W.'s material collected at St. Petersburg, March 22, a male of *vibrans* and a female of *incesta* are papered in the same envelope. His other specimens of *axilena* were taken on March 13, three and one-half miles southwest of St. Petersburg, while his twelve specimens of *vibrans* were taken on March 22, four miles southwest of town. J. H. W. collected *axilena* on thirteen days and *vibrans* on ten days in Florida. On four different days he took both species, on nine days he caught *axilena* and not *vibrans*, and on six days *vibrans* but not *axilena*. Both species certainly occurred in the same creek-enclosing woodlands at Palmdale and Enterprise, but were not found on the creeks themselves. Apparently *axilena* frequented more open spots and the edges of forests, while *vibrans* preferred denser forest.

**Libellula vibrans** Fabricius. St. Petersburg, March 22, 1913, five males and seven females, all teneral (L. A. W.); Port Orange, March 16, 1906, one male, one female (Deam); New Smyrna, April 24, 1906, one male (Deam); Fort Myers, Labelle, Palmdale and Enterprise, fourteen males and eight females; Kathwood, South Carolina, two males. For notes see above under *axilena*.